Docket No.: 2002P87057WOUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Johnson, Warren Thomas
Serial No:	10/530,900
Confirmation No:	9243
Filing Date:	April 11, 2005
For:	BACKWASH METHOD
Examiner:	Anderson, Denise R.
Art Unit:	1797

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8(a)

The undersigned hereby certifies that this document is being electronically filed in accordance with § 1.6(a)(4), on the 14th day of July, 2010.

/Gregory K. Gerstenzang/
Gregory K. Gerstenzang, Reg. No. 59,513

Commissioner for Patents

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Dear Sir:

This Appeal Brief is filed in response to the Final Office Action mailed on February 19, 2010 (hereinafter the "Office Action") in view of the Advisory Action dated April 30, 2010 and in furtherance of the Notice of Appeal filed on May 18, 2010. The fee of $540 under 37 C.F.R. § 41.20(a)(2) accompanies this filing.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest is the assignee of the instant application, namely Siemens Water Technologies Corp., a Massachusetts corporation with a place of business at 181 Thorn Hill Road, Warrendale, Pennsylvania 15086.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

There are no appeals or interferences known to Appellant, Appellant's legal representative, or the assignee of the instant application that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-9 were pending in the application as filed on April 11, 2005. Claims 1 and 3-9 were amended in a Preliminary Amendment filed April 11, 2005. Claims 1-9 were canceled and claims 10-34 were added in an Amendment filed on December 31, 2007. In an Amendment filed on April 14, 2008 claims 10, 11, 13, 18, 20, 22, and 27 were amended, claim 14 was canceled, and claims 35 and 26 were added. In an Amendment filed on December 8, 2008 claims 10, 20, 22, and 27 were amended. In an Amendment filed on April 13, 2009 claims 10, 12, 15, 18-20, 22, 24, 26, 27, 29, 30, 32, 35, and 36 were amended. In an Amendment filed on October 21, 2009 claims 22 and 27 were amended. In an Amendment filed on April 23, 2010 claim 31 was canceled. Claims 10-13, 15-30, and 32-36 currently stand rejected, with claims 10, 20, 22, and 27 being in independent form. Claims 10-13, 15-30, and 32-36 are being appealed herein.

IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

Other than the cancelation of claim 31, no claim amendments were presented in a Response filed on April 13, 2010. A copy of the claims as pending, incorporating all prior amendments and showing the status of each of the claims, is attached as a Claims Appendix beginning on page 18 of this Appeal Brief.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

Aspects and examples of the claimed subject matter are generally directed to methods and apparatus for cleaning membrane filtration modules disposed in a feed tank. In one

example, a filtration arrangement is claimed. The filtration arrangement generally includes an aeration hood comprising an upper wall and at least one downwardly extending side wall, the at least one side wall at least partially shrouding at least one membrane module vertically positioned within a feed tank. The aeration hood comprises at least one open-ended tube distinct from any side wall of the aeration hood, the at least one open-ended tube extending downwardly from the upper wall. The aeration hood is configured and arranged such that a gas fed into the aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood. Each of the at least one open-ended tubes has at least one of the at least one membrane modules mounted therein. At least one of the at least one membrane modules is in fluid communication with an interior of the feed tank through a lower end of the at least one open-ended tube. There is at least one aeration inlet in a wall of the at least one open-ended tube. The at least one downwardly extending side wall extends to below the location of the at least one aeration inlet in the wall of the at least one open-ended tube. (See Applicant's specification as originally filed at page 3, lines 7-20, and page 5, line 17 – page 7, line 14 (paragraphs [0012] and [0026] to [0028] of corresponding U.S. Patent Publication No. US2006/0000774 A1) and FIG. 1.)

In another example, a filtration arrangement is claimed. The filtration arrangement generally includes at least one membrane module positioned vertically within a feed tank, and a sleeve surrounding a periphery of the at least one membrane module. The sleeve extends partially along a length of the at least one membrane module, and has an open region adjacent to a lower end of the at least one membrane module. An aeration hood distinct from the sleeve is positioned within the feed tank to shroud the at least one membrane module at the location of the open region. The aeration hood is configured and arranged such that a gas fed into the aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood. There is at least one aeration opening in a wall of the aeration hood positioned adjacent to the open region. The aeration hood is constructed and arranged to direct a gas through the at least one aeration opening and into an interior of the sleeve through the open region upon displacement of the feed liquid in the aeration hood. There is at least one aeration outlet in the sleeve above an upper wall of the aeration hood. (See Applicant's specification as originally filed at page 7, line 14 – page 8, line 2 (paragraph [0029] of corresponding U.S. Patent Publication No. US2006/0261007 A1.) and FIG. 2)

In another example, a method of cleaning a membrane module disposed in a tank is claimed. The method generally includes immersing in feed liquid a filtration arrangement comprising an aeration hood shrouding the membrane module, the aeration hood comprising an open-ended tube distinct from any side wall of the aeration hood extending downwardly from an upper wall of the aeration hood, the open-ended tube partially enclosing the membrane module. A portion of a lower end of the membrane module extends from a lower end of the open-ended tube. The open-ended tube comprises an aeration inlet in a wall of the open-ended tube at a location spaced from an upper end thereof. The method further involves lowering a liquid level in the aeration hood by displacing feed liquid within the aeration hood with a gas, and passing the gas through the aeration inlet into a volume enclosed by the open-ended tube. (See Applicant's specification as originally filed at page 4, line 19 – page 5, line 6 and page 6, line 18 – page 7, line 5 (paragraphs [0018]- [0022] and [0027] of corresponding U.S. Patent Publication No. US2006/0261007 A1.))

In another example, a water treatment system is claimed. The water treatment system generally includes an aeration hood submerged in water to be treated, the aeration hood comprising an upper wall with an opening. A tube distinct from any side wall of the aeration hood is at least partially submerged in the water to be treated. The tube has a first open end sealingly secured to the upper wall at the opening. A membrane module is disposed within the tube. The tube extends part way along the length of the membrane module and defines an open region adjacent a lower end of the membrane module, the open region comprising a portion of the lower end of the membrane module extending from a lower end of the tube. The membrane module is in fluid communication with the water to be treated through the opening in the upper wall. (See Applicant's specification as originally filed at page 3, lines 7-20, and page 5, line 17 – page 7, line 14 (paragraphs [0012] and [0026] to [0028] of corresponding U.S. Patent Publication No. US2006/0000774 A1) and FIG. 1.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi))

Whether each of claims 10-13, 15-30, and 32-36 is unpatentable over the combination of over Horii, JP 10076264A (March 24, 1998 – esp@cenet abstract, patent publication, machine

translation, hereinafter "Horii") in view of Cote et al., U.S. Patent No. 5,607,593 (hereinafter "Cote") and further in view of Ide, JP 2277528 (hereinafter "Ide").

VII. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))

For the reasons provided below, the Examiner's rejections are improper and should be reversed. Each of claims 10-13, 15-30, and 32-36, as presented, is allowable.

A. Each of claims 10-13, 15-30, and 32-36 is patentable over the combination of Horii, Cote, and Ide.

1. One of ordinary skill in the art would not have been motivated to have combined Horii, Cote, and Ide in the manner asserted.

i. Ide explicitly teaches the undesirability of the asserted modification of the primary references.

Claims 10-13, 15-30, and 32-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Horii, Cote, and Ide.

One of ordinary skill in the art would not have been motivated to have combined Horii, Cote, and Ide in the manner asserted upon a reading of these references. Notably, Ide explicitly teaches that it would be undesirable to operate a membrane filtration apparatus to displace liquid from within an aeration hood shrouding membrane fibers as recited in the claims of the present application. In relying on Ide to provide an element of the claims of the present application which cannot be found in Horii and Cote, the Examiner is asserting that one of skill in the art would look to Ide and modify Horii in a manner that Ide explicitly teaches would be undesirable. It is illogical to assert that one of ordinary skill in the art would have been motivated to modify Horii to include a feature disclosed in Ide which Ide describes as undesirable.

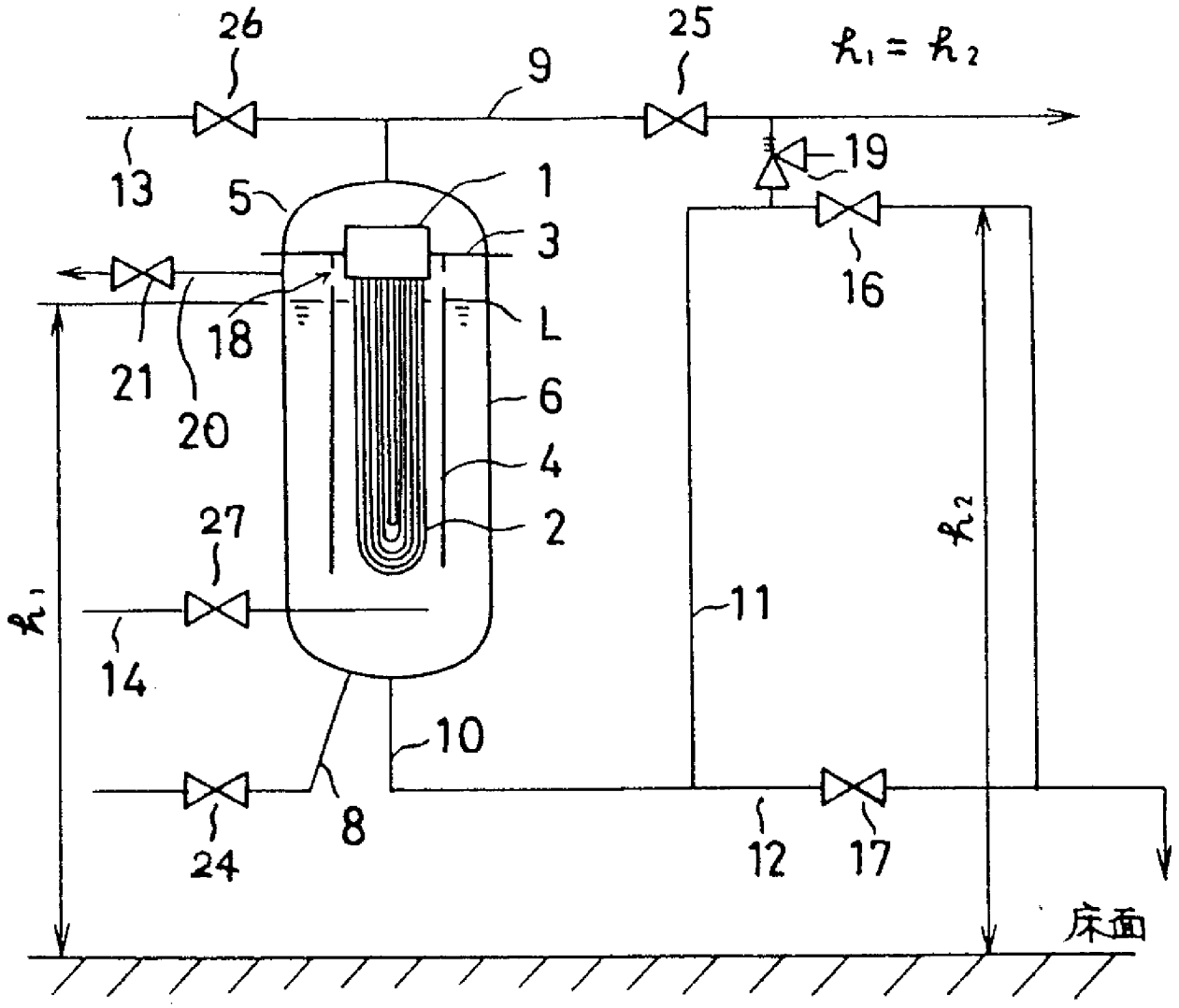
The Examiner acknowledges that Horii in view of Cote fails to disclose or suggest an "aeration hood configured and arranged such that a gas fed into the aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood" as recited in independent claims 10 and 20. (Office Action at paragraph 17.) The Examiner takes portions of Ide out of context and relies on these portions as providing a motivation for one of ordinary skill in the art to

modify the apparatus of Horii such that it included this element of independent claims 10 and 20 as well as operated in a manner including the act of "lowering a liquid level in the aeration hood by displacing feed liquid within the aeration hood with a gas" recited in independent claim 22. (Office Action at paragraphs 18 and 49.) The Examiner ignores the fact that Ide teaches that it is undesirable to operate a filtration system such that a liquid level within a tube surrounding membrane fibers is lowered during aeration, and thus would have dissuaded one of ordinary skill in the art to have modified the apparatus of Horii such that it operated in this manner.

Although Ide discloses that some prior membrane filtration systems operate in a manner wherein a level of liquid in a filtration vessel is lowered during membrane cleaning, Ide teaches that such systems exhibit numerous disadvantages, which Ide's alleged invention purportedly overcomes. For example, Ide discloses that in such prior systems, "there occurs such a problem that exposure of hollow yarn membrane to air becomes a cause for deterioration of the hollow yarn membrane" and "adhering again the particles to the hollow yarn membranes also occurs." (Ide translation at page 4, lines 10-15.) Ide further discloses that in prior membrane filtration systems in which a liquid level about the membranes is lowered during aeration "the effect of vibrating the hollow yarn membranes by air is reduced by half and a phenomenon of keeping separated fine particles in the protecting tube and adhering again the particles to the hollow yarn membrane also occurs." (Ide translation at page 4, lines 8-13.) Ide thus characterizes prior membrane filtration systems which allow a level of liquid surrounding the membranes to be lowered during cleaning as problematic; they provide for the undesirable results of deterioration and poor cleaning of the membranes.

In contrast with what the Examiner asserts, Ide's disclosure does not support that it is inherent that a gas fed into an aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood. Ide discloses the exact opposite. Ide discloses that the membrane filtration apparatus that is allegedly the subject of his invention avoids the aforementioned problems by not lowering the level of liquid surrounding membrane fibers during cleaning and aeration. For example, Ide discloses that "[t]he present invention is carried out for solving the aforementioned problem [by] prevent[ing] the lowering of liquid level . . . ." (Ide translation at page 4, line 21 - page 5, line 1.) Ide alleges that in his invention "[t]he relation with the filter water level h_1 during bubbling becomes $h_1=h_2$." (Ide translation at page 6, lines 14-15; page 9, line 6.) As can be seen in Ide FIG. 4, reproduced below, the height h_2 is above the upper wall 3

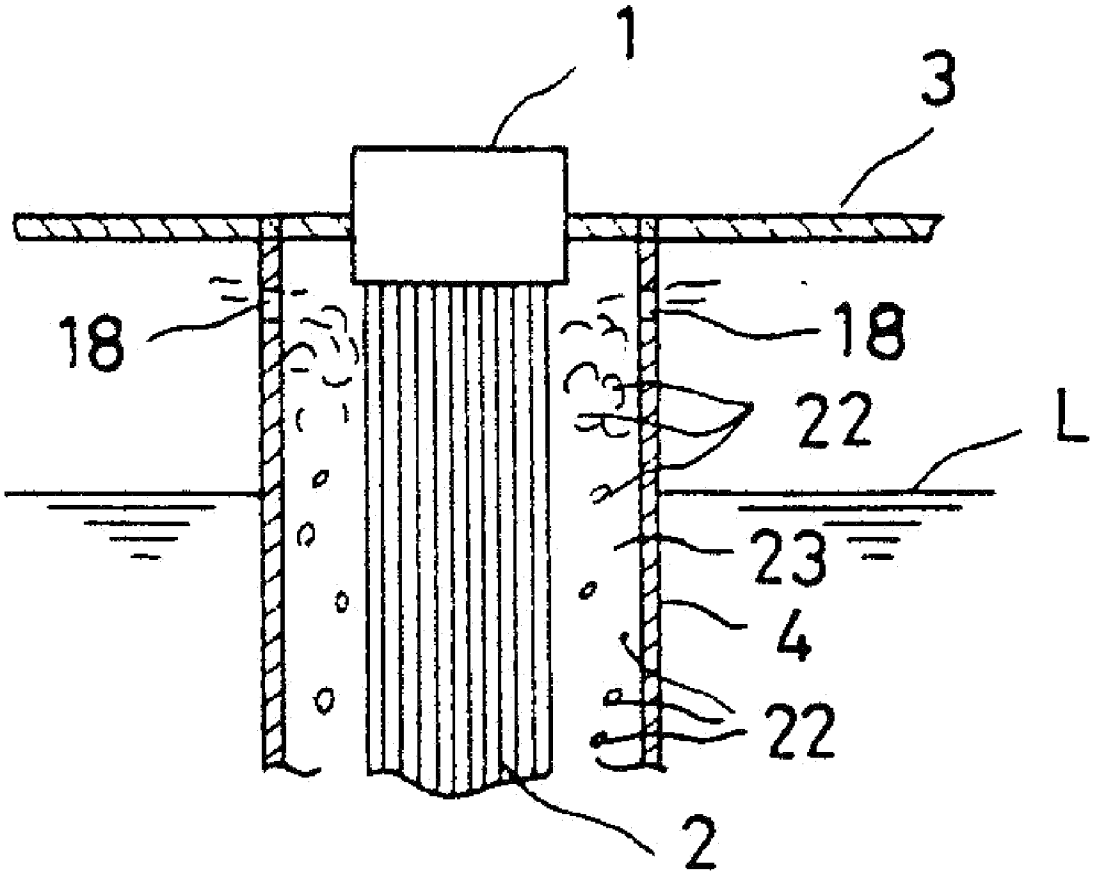
of what the Examiner characterizes as Ide's aeration hood. Thus, during introduction of air into the device of Ide, the liquid level in what the Examiner characterizes as an aeration hood does not drop.



第 4 図

Ide further discloses that, in his invention, during membrane cleaning and aeration "an air pump state" in which the membranes are completely covered with liquid (see Ide FIG. 2, reproduced below) "is always maintained so that the whole reverse washing time is effectively used and the reverse washing efficiency is improved." (Ide translation at page 7, lines 3-10 and page 8, lines 11-12, emphasis added.) Ide contrasts his filtration apparatus with other systems in

which "the air pump state disappears so that washing of the adhesion root part of the hollow yarn membranes 2 stops and the adhered impurities separated from the hollow yarn membrane 2 stay in the protecting tube 4, causing re-adhesion to the hollow yarn membrane 2." (Ide translation at page 7, lines 12-14.)



第 2 図

Thus, while prior filtration systems in which a level of a liquid surrounding membrane fibers is lowered during aeration are discussed in Ide, Ide discloses that these systems suffer from several disadvantages which one of ordinary skill in the art would seek to avoid. Ide asserts that his system avoids these disadvantages of these prior filtration systems by not lowering a level of liquid surrounding membrane fibers during cleaning.

Further, the Examiner has not provided any reasoning why an effect of "removing the adhered fine particles by generating air at the side or bottom of the hollow yarn membrane" would not be accomplished in the alleged invention of Ide which does not provide for "lower[ing] a level of feed liquid in the aeration hood" and which purportedly overcomes numerous disadvantages of filtration systems that do provide for such a lowering of a level of feed in an aeration hood. Nor has the Examiner shown any reason why "generating air at the side or bottom of the hollow yarn membrane" would provide any advantage or benefit in the system of Horii, which already provides for aeration of the membranes included therein. The Examiner has thus failed to provide any valid reasoning why one of ordinary skill in the art would have been motivated upon a reading of Ide to have modified the apparatus of Horii in the manner asserted.

In light of Ide's criticism of prior art systems in which a level of liquid in a filtration vessel is lowered during membrane cleaning, there is no merit to the Examiner's assertion that one of ordinary skill in the art would have been motivated to have combined the asserted characteristics of such prior systems with Horii upon a reading of Ide. A patent "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007). When an obviousness determination relies on the combination of two or more references, there must be some suggestion or motivation to combine the references. WMS Gaming Inc. v. Int'l Game Tech., 184 F.3d 1339, 1355 (Fed. Cir. 1999), (citing In re Rouffet, 149 F.3d at 1355.) "'[V]irtually all [inventions] are combinations of old elements.' . . . [R]ejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be 'an illogical and inappropriate process by which to determine patentability.'" In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998) (internal citations omitted). An obviousness determination requires identification of "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." KSR, 550 U.S. at 418. *See also* MPEP § 2143.01 ("A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the

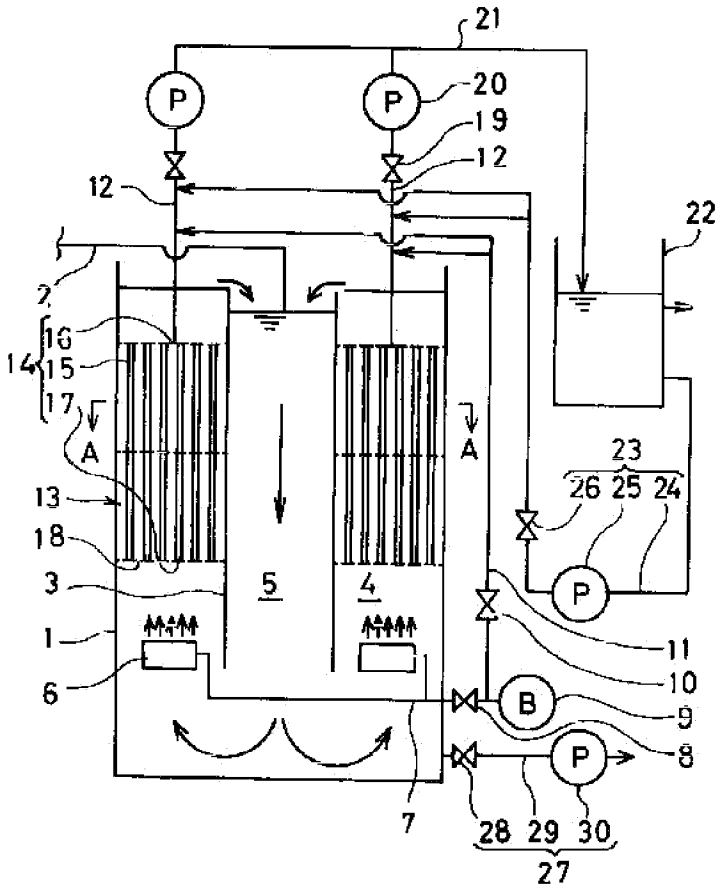
claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references.")

By ignoring the criticisms of Ide that would have dissuaded one of ordinary skill in the art from making the asserted combination of Ide, Horii and Cote, the Examiner is ignoring the context of the references in which the elements which the Examiner asserts are combinable are found. The Examiner is clearly using knowledge gleaned from the present disclosure as a roadmap to reconstruct the claims of the present application. This is an impermissible use of hindsight analysis which cannot form the basis of a valid rejection under 35 U.S.C. § 103. *See* Innogenetics, N.V. v. Abbott Labs., 512 F.3d 1363, 1373 (Fed. Cir. 2008) (citing Graham v. John Deere Co., 383 U.S. 1, 36 (1966)) (discussing "the importance of guarding against hindsight… and resist[ing] the temptation to read into the prior art the teachings of the invention in issue" when considering the obviousness of a patent); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1553 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984); Ex parte Gilham, No. 2009-000691 (BPAI Dec. 3, 2009) (reversing an Examiner's obviousness rejection for using impermissible hindsight and providing only a conclusory statement in support of why one of skill in the art would make an asserted combination of references); MPEP § 2141.01 III.

ii. One of ordinary skill in the art would not have been motivated to have modified the apparatus of Horii as asserted by the Examiner because he asserted modification would render the apparatus inoperable.

As discussed in Applicant's previous response,[1] if the header 16 of the "upflow way 4" of Horii (which the Examiner equates with an upper wall of an aeration hood) were somehow modified so as to form an aeration hood as recited in independent claims 10 and 20, this would render the filtration apparatus of Horii inoperable for its intended purpose. If gas fed into the "upflow way 4" (shown in the reproduction of FIG. 1 of Horii below) would displace feed liquid and lower a level of feed liquid therein, then the header 16 of the "upflow way 4" would also prevent the flow of liquid or gas therethrough. If the device of Horii were modified in the manner suggested by the Examiner, the device would be incapable of circulating fluid from the

"upflow way 4" to the "countercurrent way 5." Any bubbles entering Horii's alleged aeration hood would remain trapped there and prevent liquid to be filtered from reaching the membrane modules, thus rendering the filtration assembly of Horii inoperable for filtering the liquid. This would be true even if the "upflow way 4" and the "countercurrent way 5" were to be rearranged or reshaped to provide for upward flow through cylindrical channels and downward flow through rectangular or fan-shaped channels as suggested by the Examiner. (Office Action at paragraph 53b.) As such, one of ordinary skill in the art would not have been motivated to have modified Horii to include an aeration hood as recited in any of independent claims 10, 20, or 22 or the claims that depend from these claims. *See* McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1354 (Fed. Cir. 2001) ("If references taken in combination would produce a 'seemingly inoperative device,' we have held that such references teach away from the combination and thus cannot serve as predicates for a *prima facie* case of obviousness.")



[1] Applicant's Response filed October 21, 2009.

iii. No motivation to combine Horii, Cote, and Ide to obtain the aeration inlets and outlets recited in the claims of the application has been established.

The Examiner acknowledges that Horii fails to disclose aeration inlets in the walls of the tubes as recited in independent claims 10 and 22 or an aeration outlet in a sleeve as recited in independent claim 20. (Office Action at paragraphs 14, 24, and 35.) One of ordinary skill in the art would not have been motivated to have modified the apparatus of Horii to include aeration inlets in a wall of a tube or sleeve enclosing filtration membranes as allegedly disclosed in Cote, as asserted by the Examiner. (Office Action at paragraphs 14-16.) This is because doing so would have provided no benefit. The Examiner asserts that a motivation to combine the aeration inlets of the tubes of Cote with the apparatus of Horii can be found because "Cote et al. further discloses that this arrangement is used to promote circulatory flow within the tank." (Office Action at paragraph 16.) The structure of Horii, however, already provides for the circulation of fluid within the tank disclosed by introducing aerating gas from the diffuser 6 into the area including the membranes 15 formed between the outer wall of the immersion tub 1 and the bridgewalls 3 of the apparatus disclosed. (See paragraph [0015] and FIG. 1 of Horii.) In fact, one of ordinary skill in the art would have been dissuaded from incorporating the slots or aeration openings of the tubes of Cote into the apparatus of Horii (e.g., in bridgewalls 3). To have done so would have provided paths for aeration gas to escape the confined area within Horii's bridgewalls 3, resulting in aeration gas being less well confined about the filtration membranes, thereby defeating a purpose of the bridgewalls 3 of Horii.

Accordingly, there can be no *prima facie* case of obviousness of the claims of the present application over Horii, Cote, and Ide because one of ordinary skill in the art would not have been motivated to have combined these references in the manner asserted by the Examiner.

2. Even if the asserted combination of references were valid, the alleged combination still fails to teach each and every element of the present claims.

Even if Horii, Cote, and Ide could have been validly combined in the manner asserted by the Examiner, all elements of the claims of the present application still would not be found in the alleged combination of references. For example, no combination of Horii with Cote and Ide could render obvious the sleeves or open-ended tubes recited in any of claims 10-13 or 15-36. For the reasons discussed in Applicant's previous response,[2] neither Cote nor Ide, alone or in combination, disclose or suggest open-ended tubes extending downwardly from the upper wall of an aeration hood as recited in independent claims 10 and 22 or "sealingly secured to the upper wall" of an aeration hood as recited in independent claim 27. Nor does Horii disclose any open-ended tube or sleeve within the filtration arrangements as recited in any of independent claims 10, 20, 22, or 27 or the claims that depend therefrom. The Examiner characterizes partitioning walls 3 of Horii as forming the sidewalls of an aeration hood and characterizes the same partitioning walls 3 as forming tubes in which Horii's membrane modules are included. (Office Action at paragraphs 7 and 8.) If the same partitioning walls 3 of Horii form both a wall of an aeration hood and an "open-ended tube" as asserted by the Examiner, then Horii cannot disclose "the aeration hood comprising at least one open-ended tube distinct from any side wall of the aeration hood" as recited in independent claims 10 and 22, "an aeration hood positioned within the feed tank, distinct from the sleeve" as recited in independent claim 20, or "a tube distinct from any side wall of the aeration hood" as recited in independent claim 27.

The Examiner asserts that Ide also discloses an open-ended tube or sleeve (protecting tube 4) distinct from any sidewall (trunk 6) of an aeration hood. (Office Action at paragraph 53c.) This assertion, however, has already been acknowledged by the Examiner as being incorrect. As explained in the Applicant's previously filed response,[3] trunk 6 of Ide cannot be an aeration hood sidewall as alleged by the Examiner. Trunk 6 of Ide cannot be an aeration hood sidewall as claimed in any of independent claims 10, 20, 22, or 27 because it is not "positioned within a feed tank" as recited in independent claims 10 and 22, immersed in feed liquid, as

---

[2] *Id.*

recited in independent claim 22, or "submerged in water to be treated" as recited in independent claim 27. In paragraphs 26 and 27 of the Office Action mailed July 28, 2009, the Examiner acknowledged that the Applicant was correct that trunk 6 of Ide could not be an aeration hood sidewall as claimed in the present application.

As all elements of the claims of the present application are not disclosed or suggested in the asserted combination of references, no *prima facie* case of obviousness has been established, and all claims are patentable over the combination of Horii, Cote, and Ide asserted by the Examiner.

3. Independent claims 20, 22, and 27 are patentable over Horii, Cote, and Ide for even additional reasons.

Independent claim 20 is further patentable over the asserted combination of Horii, Cote, and Ide for at least an additional reason. In addition to reciting the claim elements missing from Horii, Cote, and Ide discussed above, independent claim 20 recites, in pertinent part "[a] filtration arrangement comprising . . . an aeration hood . . . [including] at least one aeration opening in a wall of the aeration hood positioned adjacent to the open region [in a sleeve]." None of Horii, Cote, or Ide disclose or suggest any aeration hood including at least one aeration opening in a wall of the aeration hood constructed and arranged to direct a gas through the at least one aeration opening and into an interior of a sleeve surrounding a periphery of a membrane module. Thus, independent claim 20, and dependent claim 21, which depends therefrom, further patentably distinguish over the asserted combination of Horii, Cote, and Ide.

Further, the elements recited in independent claims 20, 22, and 27 of the sleeve (or open-ended tube) extending only partially along a length of a membrane module cannot be rendered obvious by the asserted combination of Horii, Cote, and Ide.

The Examiner asserts that Ide teaches that it is known in the art to extend a sleeve or tube partially along the length of a membrane module such that an open region is without a sleeve, or such that a portion of the lower end of the membrane module extends from the lower end of the

---

[3] Applicant's Response filed April 13, 2009.

tube. (Office Action at paragraphs 25, 26, and 36.) The Examiner further asserts that one of ordinary skill in the art would have been motivated to extend the sleeve (bridgewalls 3) of Horii partially along the length of the membrane in this manner because "this is an example of simple substitution of one known element (extend the sleeve along the length of the membrane module) for another (extend the sleeve partially along the length of the membrane module, such that the open region is without a sleeve) to obtain a predictable results (the air enters the module from its lower end, while the sleeve protects the membranes along most of their length)." (Office Action at paragraphs 26 and 36.) This assertion however, does not establish that one of ordinary skill in the art would have been motivated to have made this asserted modification to Horii.

Horii already provides for air from diffusers 6 to enter the membrane modules from a lower end thereof and for a sleeve (bridgewalls 3) to protect the membranes along their length. Thus, there would be no advantage or benefit which would have motivated one of ordinary skill in the art to have modified Horii according to Ide as suggested by the Examiner. An assertion that a modification could be made does not, by itself, establish that one of skill in the art would have been motivated to have made the modification. See citations to KSR v. Teleflex, WMS Gaming v. Int'l Game Tech., In Re Roufett, and MPEP § 2143.01 above.

The Examiner has thus not established that there would have been any motivation to have made the asserted modification to Horii in view of Cote and/or Ide to render the elements of independent claims 20, 22, and 27 indicated above obvious.

B. Summary

The Examiner has failed to establish a *prima facie* case of obviousness of any of the claims of the present application over the asserted combination of Horii, Cote, and Ide. The Examiner has failed to establish that there would have been any motivation for one of ordinary skill in the art to have combined these references in the manner asserted. The reasons asserted by the Examiner as to why one of ordinary skill in the art would have been motivated to have combined Horii, Cote, and Ide in the manner asserted are not valid. In particular, the Examiner asserts that one of ordinary skill in the art would have been motivated to have modified Horii to include a feature of prior systems described in Ide which Ide explicitly describes as undesirable. The Examiner also illogically asserts that one of skill in the art would have been motivated to have modified Horii in a manner which would render the apparatus disclosed incapable of

functioning for its intended purpose. Further, even if there were some motivation for one of ordinary skill in the art to have made the asserted combination of references, this combination would still fail to disclose or suggest each element of any of the claims of the present application.

The Examiner selectively chooses portions of the cited references out of context, using the present claims as a roadmap to reconstruct the claimed invention; all this, and the Examiner still fails to find all elements of the recited claims in the cited references and fails to show any valid motivation why one of ordinary skill in the art would have made the asserted combinations.

In view of the above, each of the rejections is improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii))

1-9. (canceled)

10. (previously presented): A filtration arrangement comprising:

an aeration hood comprising an upper wall and at least one downwardly extending side wall, the at least one side wall at least partially shrouding at least one membrane module vertically positioned within a feed tank, the aeration hood comprising at least one open-ended tube distinct from any side wall of the aeration hood, the at least one open-ended tube extending downwardly from the upper wall, the aeration hood configured and arranged such that a gas fed into the aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood,

each of the at least one open-ended tubes having at least one of the at least one membrane modules mounted therein, at least one of the at least one membrane modules in fluid communication with an interior of the feed tank through a lower end of the at least one open-ended tube,

at least one aeration inlet in a wall of the at least one open-ended tube, and

the at least one downwardly extending side wall extending to below the location of the at least one aeration inlet in the wall of the at least one open-ended tube.

11. (previously presented): The filtration arrangement according to claim 10, wherein at least one of the aeration hood side walls is formed by a side wall of the feed tank with the upper wall being sealingly attached to the at least one aeration hood side wall.

12. (previously presented): The filtration arrangement according to claim 10, wherein the at least one aeration inlet is disposed adjacent to a lower end of the at least one open-ended tube.

13. (previously presented): The filtration arrangement according to claim 10, wherein each of the at least one membrane modules is mounted in a corresponding open-ended tube.

14. (canceled)

15. (previously presented): The filtration arrangement according to claim 10, wherein the at least one aeration inlet is shaped as a slot.

16. (previously presented): The filtration arrangement according to claim 10, further comprising an aeration header located below the aeration hood.

17. (previously presented): The filtration arrangement according to claim 10, wherein the at least one side wall extends downward to at least a downward extent of a lower end of the at least one open-ended tube.

18. (previously presented): The filtration arrangement according to claim 15, wherein the at least one aeration inlet is spaced adjacent to a lower end of the at least one open-ended tube.

19. (previously presented): The filtration arrangement according to claim 10, wherein the at least one aeration inlet is shaped as an open-ended slot extending upwardly from a lower end of the at least one open-ended tube.

20. (previously presented): A filtration arrangement comprising:

at least one membrane module positioned vertically within a feed tank;

a sleeve surrounding a periphery of the at least one membrane module, the sleeve extending partially along a length of the at least one membrane module, and having an open region adjacent to a lower end of the at least one membrane module;

an aeration hood positioned within the feed tank, distinct from the sleeve, positioned to shroud the at least one membrane module at the location of the open region, the aeration hood configured and arranged such that a gas fed into the aeration hood will displace feed liquid and lower a level of feed liquid in the aeration hood;

at least one aeration opening in a wall of the aeration hood positioned adjacent to the open region, the aeration hood constructed and arranged to direct a gas through the at least one aeration opening and into an interior of the sleeve through the open region upon displacement of the feed liquid in the aeration hood; and

at least one aeration outlet in the sleeve above an upper wall of the aeration hood.

21. (previously presented): The filtration arrangement of claim 20, wherein the open region is defined by at least one opening in the sleeve.

22. (previously presented): A method of cleaning a membrane module disposed in a tank comprising:

immersing in feed liquid a filtration arrangement comprising an aeration hood shrouding the membrane module, the aeration hood comprising an open-ended tube distinct from any side wall of the aeration hood extending downwardly from an upper wall of the aeration hood, the open-ended tube partially enclosing the membrane module, a portion of a lower end of the membrane module extending from a lower end of the open-ended tube, the open-ended tube comprising an aeration inlet in a wall of the open-ended tube at a location spaced from an upper end thereof;

lowering a liquid level in the aeration hood by displacing feed liquid within the aeration hood with a gas; and

passing the gas through the aeration inlet into a volume enclosed by the open-ended tube.

23. (previously presented): The method of cleaning the membrane module of claim 22, further comprising maintaining a liquid seal at a lower end of the tube.

24. (previously presented): The method of cleaning the membrane module of claim 23, further comprising maintaining a pressure drop across the aeration inlet sufficient to maintain the liquid seal.

25. (previously presented): The method of cleaning the membrane module of claim 22, further comprising withdrawing permeate through the membrane module.

26. (previously presented): The method of cleaning the membrane module of claim 22, wherein the act of passing gas through the aeration inlet comprises scouring the membrane module with gas passed through the aeration inlet.

27. (previously presented): A water treatment system, comprising:

an aeration hood submerged in water to be treated, the aeration hood comprising an upper wall with an opening;

a tube distinct from any side wall of the aeration hood at least partially submerged in the water to be treated, the tube having a first open end sealingly secured to the upper wall at the opening; and

a membrane module disposed within the tube, the tube extending part way along the length of the membrane module and defining an open region adjacent a lower end of the membrane module, the open region comprising a portion of the lower end of the membrane module extending from a lower end of the tube, the membrane module in fluid communication with the water to be treated through the opening in the upper wall.

28. (previously presented): The water treatment system of claim 27, further comprising an aeration header submerged below the aeration hood.

29. (previously presented): The water treatment system of claim 27, wherein the tube comprises at least one aeration inlet disposed at a tube wall thereof.

30. (previously presented): The water treatment system of claim 29, wherein the membrane module is in fluid communication with water to be treated within the aeration hood through the at least one aeration inlet.

31. (canceled)

32. (previously presented): The water treatment system of claim 29, wherein the membrane module is in fluid communication with air in the aeration hood through the at least one aeration inlet.

33. (previously presented): The water treatment system of claim 32, wherein the tube has a second open end in fluid communication with the water to be treated within the aeration hood.

34. (previously presented): The water treatment system of claim 33, wherein at least one aeration opening is disposed proximate the second open end.

35. (previously presented): The filtration arrangement of claim 10, wherein the at least one aeration inlet in the wall of the at least one open-ended tube is at a location spaced from the upper end of the at least one open-ended tube.

36. (previously presented) The method of claim 22, wherein displacing the feed liquid within the aeration hood with a gas comprises displacing the feed liquid to a level below the location of the aeration inlet.

IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))

None.

X. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x))

None.

XI. CONCLUSION

For the reasons provided above, the rejections are improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

If there is any additional fee occasioned by this filing, including an extension fee that is not covered by an accompanying payment, please charge any deficiency to Deposit Account No. 50/2762, Ref. No. M2019-7023US.

Respectfully submitted,
Warren Thomas Johnson et al., Appellant

By: /Gregory K. Gerstenzang/

Peter C. Lando, Reg. No. 34,654
Gregory K. Gerstenzang, Reg. No. 59,513
LANDO & ANASTASI, LLP
One Main Street
Cambridge, Massachusetts 02142
United States of America
Telephone: 617-395-7000
Facsimile: 617-395-7070

Siemens Docket No.: 2002P87057WOUS
L&A Docket No.: M2019-7023US